LISTING OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (previously presented) A shape of endoscope detecting apparatus comprising:

a shape detecting means for detecting the shape of a portion of an insertion unit of an endoscope inserted into a subject, and producing graphic data expressing the shape thereof;

a first marker means for marking a position on the subject at which the endoscope is inserted;

a first location information of marker acquiring means for acquiring location information of said first marker means; and

a display control means for graphically indicating intracavity insertion shape data produced by the shape detecting means, the display control means being configured to graphically indicate on a display means the shape of an intracavitary portion of the insertion unit obtained by subjecting the intracavity insertion shape data produced by the shape detecting means to coordinate processing with the location information of the marker acquired by the marker acquiring-means as a reference.

2. (previously presented) A shape of endoscope detecting apparatus according to Claim 1, wherein said location information is a first point of coordinates in a predetermined coordinate system, and further comprising:

a second marker means independent of said first marker means and movable to any position on the subject;

a second location information of marker acquiring means for acquiring location information of said second marker means as a second point of coordinates contained in the coordinate system;

a point of coordinates shifting means for shifting the first point of coordinates acquired by said first location information of marker acquiring means with respect to the second point of coordinates acquired by said second location information of marker acquiring means; and

a display control means for graphically indicating on said display means the location information of said first marker means according to the first point of coordinates shifted by said point of coordinates shifting means.

3. (previously presented) A shape of endoscope detecting apparatus according to Claim 1, wherein location information of said first marker means is a first point of coordinates contained in a predetermined coordinate system, and further comprising:

a second marker means independent of said first marker means and movable to any position on the subject;

a second location information of marker acquiring means for acquiring location information of said second marker means as a second point of coordinates contained in the coordinate system;

a point of coordinates shifting means for shifting the first point of coordinates acquired by said first location information of marker acquiring means and points of coordinates defining the shape of an inserted portion of the insertion unit with respect to the second point of coordinates acquired by said second location information of marker acquiring means; and,

a display control means to process coordinates for graphically indicating on said display means the location information of said first marker means and the shape of the inserted portion according to the first point of coordinates and the points of coordinates defining the shape of the inserted portion which are shifted by said point of coordinates shifting means.

4. (previously presented) A shape of endoscope detecting apparatus according to Claim 1, wherein said location information is a first point of coordinates in a predetermined coordinate system, and further comprising:

a second marker means independent of said first marker means and movable to any position on the subject;

a second location information of marker acquiring means for acquiring location information of said second marker means as a second point of coordinates contained in the coordinate system when the insertion unit of the endoscope has just been inserted into the subject;

a point of coordinates shifting means for shifting the first point of coordinates acquired by said first location information of marker acquiring means with respect to the second point of coordinates acquired by said second location information of marker acquiring means; and ,

a display control means to process coordinates for graphically indicating on said display means the location information of said first marker means according to the first point of coordinates shifted by said point of coordinates shifting means.

5. (currently amended) A shape of endoscope detecting apparatus comprising:

a shape detecting means for detecting the shape of a portion of an insertion unit of an endoscope inserted into a subject, and producing graphic data expressing the shape ~~thereof~~ of the portion of the insertion unit;

a marker means for marking a position on the subject at which the endoscope is inserted;

a location information of marker acquiring means for acquiring location coordinates information of said marker means; and

a display control means ~~to process~~ for processing graphic data coordinates for graphically indicating on a display means the shape of a portion of the insertion unit lying in the subject beyond said marker means, wherein ~~said shape detecting means~~ ~~detects the shape of said portion of said insertion unit of said endoscope inserted into said subject~~ the graphic data coordinates processing using as a reference the location coordinates information of said marker means acquired by said location information of marker acquiring means, and ~~disabling~~ the graphical indication on said display means of the shape-of [[a]] the portion ~~thereof~~ lying outside the subject beyond said marker means is disabled.

6. (currently amended) A shape of endoscope detecting apparatus comprising:

a shape detecting means for detecting the shape of a portion of an insertion unit of an endoscope inserted into a subject, and producing graphic data expressing the shape ~~thereof~~ of the portion of the insertion unit;

an endoscope manipulation information acquiring means for acquiring manipulation information representing manipulations performed on the endoscope inserted into the subject;

a marker means for marking a position on the subject at which the endoscope is inserted;

a location information of marker acquiring means for acquiring location coordinates information of said marker means;

a display control means ~~to process~~ for processing graphic data coordinates for graphically indicating on a display means the shape of the inserted portion detected by said shape detecting means, wherein ~~said shape detecting means detects the shape of the inserted portion~~ the graphic data coordinates processing using as a reference the location coordinates information of said marker means acquired by said location information of marker acquiring means; and

a superimposing means for superimposing on said display means the manipulation information acquired by said endoscope manipulation information acquiring means on the shape of the inserted portion graphically indicated by said display control means.

7. (currently amended) A shape of endoscope detecting apparatus according to Claim 6, wherein said superimposing means superimposes an absolute scale on the shape of [[an]] the inserted portion graphically indicated on said display means.

8. (currently amended) A shape of endoscope detecting apparatus according to Claim 6, wherein said superimposing means superimposes the length of [[a]] the portion of the insertion unit of the endoscope inserted in to the subject, ~~which is~~ the length of the portion being detected by a length of inserted portion detecting means, on the shape of the inserted portion graphically indicated on said display means.

9. (currently amended) A shape of endoscope detecting method comprising the steps of:

a first marker placing step of placing a first marker near a region of a subject through which an endoscope is inserted;

a first location information of marker acquiring step of acquiring first location coordinates information of said first marker;

a shape of inserted portion detecting step of detecting the shape of a portion of an insertion unit of the endoscope inserted into the subject;

~~using as a reference the location information of said first marker, and~~

producing graphic data expressing the shape ~~thereof~~ of the portion of the insertion unit;

a display control step [[to]]of processing graphic data coordinates using the first location coordinates of said first marker as a reference; and ~~for~~

graphically indicating on a display means the shape of the inserted portion detected at said shape of inserted portion detecting step.

10. (currently amended) A shape of endoscope detecting method according to Claim 9, further comprising the steps of:

~~wherein location information of said first marker is a first point of coordinates contained in a predetermined coordinate system, and further comprising:~~

a step of acquiring second location coordinates information of a second marker, ~~which is~~ the second marker being independent of said first marker and movable to any position on the subject, ~~as a second point of coordinates~~ ~~contained in the coordinated system~~;

a step of shifting the first ~~point of~~ coordinates acquired at said first location information of marker acquiring step with respect to the second ~~point of~~ coordinates acquired at said second location information of marker acquiring step; and

a step of extending display control to process coordinates for graphically indicating ~~on said display means~~ the first location coordinates information of said first marker ~~according to the first point of coordinates~~ shifted at said point of coordinates shifting step.

11. (currently amended) A shape of endoscope detecting method according to Claim 9, further comprising the steps of:

~~wherein location information of said first marker is a point of coordinates contained in a predetermined coordinate system, and further comprising:~~

a step of acquiring second location coordinates information of a second marker, ~~which is~~ the second marker being independent of said first marker and movable to any position on the subject~~, as a second point of coordinates~~ ~~contained in the coordinate system~~;

a step of shifting the first ~~point of~~ coordinates acquired at said first location information of marker acquiring step and ~~points of~~ coordinates defining the shape of an inserted portion of the insertion unit with respect to the second ~~point of~~ coordinates acquired at said second location information of marker acquiring step; and a step of extending display control to process coordinates for-graphically indicating on said display means the first location coordinates information of said first marker and the shape of the inserted portion according to the first ~~point of~~ coordinates and the points of coordinates defining the shape of the inserted portion which are shifted at said point of coordinates shifting step.

12. (currently amended) A shape of endoscope detecting method according to Claim 9, further comprising the steps of:

~~wherein location information of said first marker is a first point of coordinates contained in a predetermined coordinate system, and further comprising the steps of:~~

acquiring second location coordinates information of a second marker, ~~which is~~ the second marker being independent of said first marker and movable to any position on the subject, ~~as a second point of coordinates contained in the coordinate system~~ when the insertion unit of the endoscope has just been inserted into the subject;

shifting the first ~~point of~~ coordinates acquired at said first location information of marker acquiring step with respect to the second ~~point of~~ coordinates acquired at said second location information of marker acquiring step; and

extending display control to process graphic data coordinates for graphically indicating on said display means the first location coordinates information of said first marker ~~according to the first point of coordinates~~ shifted at said point of coordinates shifting step.

13. (currently amended) A shape of endoscope detecting method comprising the steps of:

placing a predetermined marker near a region of a subject through which an insertion unit of an endoscope is inserted into a subject;

acquiring location coordinates information of said marker;

detecting the shape of a portion of [[an]] the insertion unit of the endoscope inserted into the subject;

~~using as a reference the location information of said marker, and~~

producing graphic data expressing the shape ~~thereof~~ of the portion of the insertion unit;

[[and]]

extending display control to process graphic data coordinates using the location information as a reference;[[for]]

graphically indicating ~~on a display means~~ the shape of [[a]] the portion of the insertion unit lying in the subject beyond said marker[[,]]; and [[to]]

~~disable~~ disabling~~-~~graphical indication ~~on said display means~~ of the shape of [[a]] the portion ~~thereof~~ lying outside the subject beyond said marker.

14. (currently amended) A shape of endoscope detecting method comprising the steps of:

placing a predetermined marker near a region of a subject through which an insertion unit of an endoscope is inserted into a subject;

acquiring location coordinates information of said marker;

detecting the shape of [[a]]the portion of [[an]]the insertion unit of the endoscope inserted into the subject; ~~using as a reference the location information of said marker, and~~

producing graphic data expressing the shape ~~thereof~~ of the portion the insertion unit;

acquiring manipulation information representing manipulations performed on the endoscope inserted into the subject;

extending display control to process graphic data coordinates for graphically indicating on a display ~~means~~ the shape of the inserted portion; and

superimposing the manipulation information acquired by said endoscope manipulation information acquiring step on the shape of the inserted portion graphically indicated on said display means at said display control step.

15. (currently amended) A shape of endoscope detecting method according to Claim 14, further comprising a step of: ~~wherein~~ ~~at said manipulation information~~ superimposing~~-step,~~ an absolute scale ~~is superimposed~~ on the shape of the inserted portion of the endoscope graphically indicated on said display means.

16. (currently amended) A shape of endoscope detecting method according to Claim 14, further comprising:

a step of detecting the length of [[a]]the portion of the insertion unit of the endoscope inserted into the subject; and

a step of superimposing the length of the inserted portion detected at said length of inserted portion detecting step on the shape of the inserted portion of the endoscope graphically indicated on said display means.